MONTANA CLINICAL COMMUNICATION AND SURVEILLANCE REPORT

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DIABETES EDUCATION IN MONTANA: WHO RECEIVES IT, EFFECTS ON CARE AND OPPORTUNITIES FOR IMPROVEMENT?

WHAT'S INSIDE

MONTANA
Department of Public Health & Human Services

MONTANA
CARDIOVASCULAR HEALTH AND DIABETES PROGRAMS

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BACKGROUND

The prevalence of diabetes in the United States has increased over the past decade to a level of 7.5% in 2006, primarily due to an increase in the prevalence of obesity.[1,2] In the same time period, the diabetes rate in Montana climbed to 6.4% or 48,000 Montana adults with diabetes. Poor management of diabetes and its complications can lead to blindness, kidney disease and amputation, as well as increased risk of heart disease and stroke.[3] In addition to numerous health problems caused by diabetes, it is also very costly to treat; accounting for 32% of Medicare spending and a total direct and indirect cost of $174 billion in 2007.[3]

One method for improving care among patients with diabetes is diabetes self management education (DSME). DSME is a collaboration between multiple health care providers to provide patients with diabetes the knowledge and skills to successfully self manage their disease. The principles of DSME outlined in the AADE7 Self Care Behaviors include: healthy eating, being active, monitoring, taking medication, problem solving, healthy coping and reducing risks.[4] DSME has been shown

to successfully lower the average cost of patients' diabetes care and improve clinical outcomes such as A1c and LDL measures.[5]

In Montana, 60% of patients with diabetes in 2006 reported taking a class in how to self manage their disease, meeting the Healthy People 2010 goal of 60%. The rate of receiving DSME has remained unchanged over the last ten years, even in light of the benefits of receiving DSME.[2] Additionally, the Montana Diabetes Project recently surveyed DSME programs across the state and found they have additional capacity to provide diabetes education to more patients with diabetes.[6] This report will discuss the characteristics of Montana residents with diabetes who reported receiving a class in how to self manage their disease in 2008, and their uptake of diabetes care indicators.

METHODS

The Behavioral Risk Factor Surveillance Survey (BRFSS) is conducted each year in all 50 states, the District of Columbia and in three US territories (Guam, Puerto Rico and the Virgin Islands), to assess the health status of the population. Each year, the question "Have you ever been told by a doctor that you have diabetes?" is asked to assess the prevalence of diagnosed diabetes. Women reporting diabetes only during pregnancy (gestational diabetes) are excluded from diabetes prevalence estimates.

The State of Montana also includes a 10 question module of diabetes-related questions to assess diabetes care: How old were you when you were told you have diabetes?; Are you now taking insulin?; About how often do you check your blood for glucose or sugar? Include times when checked by a family member or friend, but do NOT include times when checked by a health professional.; A test for "A one C" measures the average level of blood sugar over the past three months. About how many times in the past 12 months has a doctor, nurse, or other health professional checked you for "A one C"?; About how many times in the past 12 months has a health professional checked your feet for any sores or irritations?; When was the last time you had an eye exam in which the pupils were dilated?; and Have you ever taken a course or class in how to manage your diabetes yourself? Responses from some of the questions were used to assess the prevalence of A1c testing, daily blood glucose monitoring, dilated eye exams and foot exam, as well as confounding variables. BRFSS also includes questions assessing the prevalence of influenza vaccination and pneumococcal inoculation.

Data were analyzed using SAS for Windows (release 9.1; SAS Institute Inc., Cary, NC) and SUDAAN (release 10.0; Research Triangle Institute, Inc., Research Triangle Park, NC) statistical software programs. To take into account sample design, sample weights were used in the estimation process. Standard errors were calculated using Taylor series linearization. Multiple logistic regression analysis was used to assess independent predictors of reporting diabetes self-management education and receiving each diabetes care indicator.

RESULTS

Who receives diabetes education?

Fifty-six percent of Montana adults with diabetes reported ever taking a course in diabetes self-management education. Table 1 compares the demographics of Montana adults reporting receiving DSME to those who report not receiving DSME, with the demographics of the entire Montana adult diabetes cohort as a reference. In unadjusted analyses, those receiving DSME were slightly younger, had a slightly longer duration of diabetes and were more likely to be women, compared to those not receiving DSME. Adults reporting DSME appear to have a higher socioeconomic status, as evidenced by higher income and higher education attainment, compared to adults not receiving DSME. Current smoking was less prevalent and insulin use was more prevalent among those receiving DSME. The racial breakdown of both cohorts was the same as the population of adults with diabetes in Montana. The prevalence of health care coverage was also the same across cohorts.

In adjusted analysis, sex, age, insulin use, smoking and educational status remained independent predictors of reporting receiving diabetes education. Women were 54% more likely to report receiving DSME compared to men (OR: 1.54 [1.23-1.91]). Those under age 65 were more likely to receive DSME, with those 18-44 years old 68% more likely and those 45-64 years old 37% more likely to receive DSME compared to those over age 65 (OR: 1.68 [1.14-2.48], 1.37 [1.09-1.74], respectively). Insulin use had the largest association with receiving diabetes education, with insulin users two times more likely to receive DSME compared to non-users (OR: 2.13 [1.63-2.80]). Higher education was associated with higher prevalence of receiving diabetes education. Compared to high school graduates, those who did not graduate high school were 43% less likely to receive DSME (OR: 0.57 [0.40-0.82); those who attended some college and those who graduated college were 45% and 75% more likely to receive DSME, respectively (OR: 1.45 [1.10-1.91], 1.73 [1.30-2.29]). And non-smokers were 46% more likely to report receiving diabetes education compared to smokers (OR 1.46 [1.08-1.98]).

Is diabetes education associated with diabetes care indicators?

In both adjusted and unadjusted analyses, reporting receiving diabetes education was associated with higher reported prevalence of diabetes care indicators (annual A1c, annual eye exam, annual foot exam, annual influenza vaccination, pneumococcal inoculation and daily blood glucose monitoring). Reporting receiving diabetes education was associated with a 7-13% percentage point higher prevalence of reporting receiving or engaging in diabetes care practices (Figure 1).

In adjusted analyses, diabetes education remained an independent predictor of reporting receiving diabetes care (Table 2). Reporting receiving DSME had a

Table 1. Demographics of Montana adults with diabetes who reported receiving diabetes education and those who reported not receiving diabetes education, Montana, 2004-2008.

	Diabetes Education	No Diabetes Education	All
	Mean [95% CI]	Mean [95% CI]	Mean [95% CI]
Age (years)	59 [57-60]	62 [61-64]	60 [59-61]
Duration of diabetes (years)	9 [8-10]	7 [6-8]	8 [8-9]
	% [95% CI]	% [95% CI]	% [95% CI]
Sex			
Men	46 [43-50]	54 [50-57]	50 [48-53]
Women	55 [51-59]	45 [41-49]	50 [47-52]
Race			
American Indian	9 [7-11]	11 [9-14]	10 [8-11]
White	83 [81-86]	83 [80-85]	83 [81-85]
Income			
<$20,000	34 [31-37]	43 [39-47]	38 [36-40]
>$20,000	66 [63-69]	57 [53-61]	62 [60-64]
Education			
<High school	7 [6-10]	16 [14-19]	11 [10-13]
High school graduate	33 [30-36]	39 [35-42]	35 [33-38]
Some college	31 [28-34]	24 [21-28]	28 [26-30]
College graduate	29 [26-32]	21 [18-24]	26 [23-28]
Current smoker	16 [13-18]	20 [17-24]	18 [16-20]
Health care coverage	86 [83-88]	85 [82-88]	85 [83-87]
Medications			
Insulin	33 [30-36]	19 [16-22]	27 [24-29]
Pills	64 [60-68]	67 [62-71]	65 [62-68]

Table 2. Independent predictors of reporting receiving or engaging in diabetes care, by diabetes care indicator, Montana 2004-2008.

Model Variables	DSME	Insulin Use	Have Health Care Coverage	Men	Age: 45-64 years	Age: 65+ years
Indicator	Odds Ratio [95% confidence interval]					
Annual A1c test*	2.1 [1.3-3.4]	2.3 [1.2-4.2]	3.8 [2.3-6.1]			
Daily blood glucose monitoring	1.4 [1.1-1.7]	6.8 [4.6-9.9]		0.7 [0.6-0.9]		
Annual eye exam	1.4 [1.1-1.9]	1.9 [1.4-2.6]	1.5 [1.0-2.2]		1.9 [1.3-2.8]	3.6 [2.5-5.4]
Annual foot exam	1.8 [1.3-2.3]	1.6 [1.1-2.3]				
Annual influenza vaccination	1.6 [1.3-2.0]		1.9 [1.3-2.7]		1.9 [1.3-2.8]	4.3 [2.9-6.5]
Pneumococcal inoculation	1.7 [1.3-2.1]	1.8 [1.3-2.4]			1.8 [1.2-2.6]	6.6 [4.5-9.7]

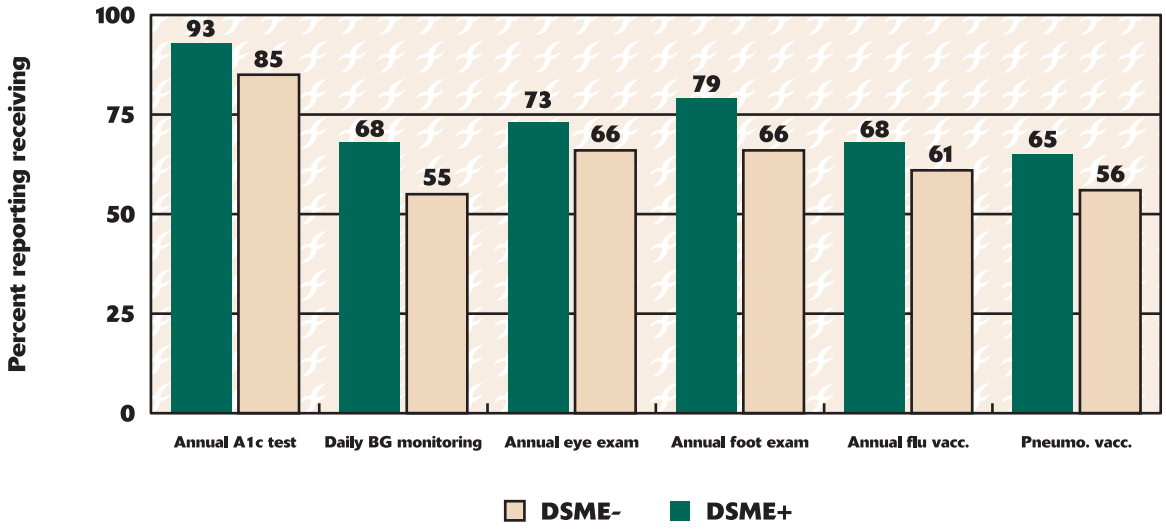
*In this model, covariates are also adjusted for duration of diabetes as a continuous variable.

similar magnitude of association for each indicator, with those receiving DSME 40-100% more likely to receive a diabetes care indicator. In models, DSME was the strongest predictor of reporting receiving an annual foot exam. Insulin use was a predictor of diabetes care in all models except for that of receiving an annual influenza vaccination. Having health care coverage was a predictor of having an annual A1c test, eye exam and influenza vaccination. Older age was the strongest predictor of having an annual eye exam, annual influenza vaccination and having been inoculated for pneumococcal bacteria.

DISCUSSION

Those receiving diabetes self-management education were more often women, under age 65, non-smokers, more highly educated and more likely to be insulin users compared to those not receiving DSME. After adjusting for potential confounders, DSME was a strong predictor of receiving or engaging in diabetes care, with those reporting DSME 40-100% more likely to receive or engage in diabetes care. Monitoring and Reducing Risk are two of the seven components of the AADE7 Self-care Behaviors taught by many diabetes educators, stressing

Figure 1. Prevalance of reporting receiving or engaging in diabetes management among those reporting.



the importance of daily blood glucose monitoring and receiving vaccinations and exams to help prevent, delay or provide early recognition for common diabetes complications. Thus, it is not surprising that those receiving this education receive or engage in more diabetes care practices compared to those not receiving this education.

These data highlight opportunities for the promotion of DSME among specific groups of patients with diabetes. Current smokers are at increased risk of complications from diabetes, but fewer smokers report receiving DSME than non-smokers. This could be a potential missed opportunity for educating patients about risk factors, particularly tobacco use, to enhance diabetes care. Also, similar numbers of persons with diabetes who have health care coverage report not receiving DSME as those who do receive DSME. Both provider and patient awareness of diabetes benefits in their health plan may improve the utilization and referral to DSME. Lastly, due to the relatively flat utilization rate of DSME over the past 10 years, referral of all eligible patients to DSME is important.

Our data suggest that diabetes self-management education is a strong predictor of engaging in or receiving diabetes care. We also know that diabetes educators across the state have the capacity to provide DSME to more patients. Our goal is to improve the number of persons with diabetes receiving optimal diabetes care; therefore, it is essential to promote DSME to persons with diabetes and encourage provider referral to DSME.

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SAVE THE DATE

MONTANA DIABETES CONFERENCE 2010
OCTOBER 21-22, 2010
Holiday Inn – Missoula, Montana

The Montana Diabetes Conference 2010: Evidence Based Opportunities to Improve Diabetes Care will be held on October 21-22, 2010 at the Holiday Inn Downtown at the Park in Missoula, Montana. For more information, contact Susan Day at (406) 444-6677.

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MONTANA CARDIOVASCULAR HEALTH AND DIABETES PROGRAMS

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WHAT ARE THE MONTANA DIABETES PREVENTION AND CARDIOVASCULAR HEALTH PROGRAMS AND HOW CAN WE BE CONTACTED?

The Montana Diabetes Control and Cardiovascular Health Programs are funded through cooperative agreements with the Centers for Disease Control and Prevention and Health Promotion (1U58DP001977-01), the Division for Heart Disease and Stroke Prevention (5U50 DP000736-03) and through the Montana Department of Public Health and Human Services.

The mission of the Diabetes Control and Cardiovascular Health Programs is to reduce the burden of diabetes and cardiovascular disease among Montanans. Our web pages can be accessed at http://www.diabetes.mt.gov and http://montanacardiovascular.state.mt.us.

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